Advanced Principles of Agriculture

Advanced Principles of Agriculture includes standards that challenge students to plan for one of the five career clusters in agriculture. Understanding the skills necessary to be successful in an agriculture career is important for students as they enter the agricultural industry in the 21st century.

Pre-requisite: **None**

Recommended Credit: **1**

Recommended Grade Level: **10th, 11th**

***** **All learning expectations must be met for the 1 credit in this course.**

Advanced Principles of Agriculture

Standard 1.0

The student will analyze the career opportunities available in the agriculture industry and develop plans for entry into the area of personal interest.

Standard 2.0

The student will demonstrate skills needed for career planning, record keeping and leadership in the agriculture industry.

Standard 3.0

The student will relate the basic principles of animal science to livestock selection, health and maintenance.

Standard 4.0

The student will relate the principles of soil formation, management and capability to crop production and construction uses.

Standard 5.0

The student will demonstrate the basic principles of agriculture mechanics, including metalworking, plumbing, electricity, land leveling and land measuring.

Standard 6.0

The student will demonstrate the integration of academic competencies in Advanced Principles of Agriculture.

Standard 7.0

The student will develop premier leadership and personal growth in the area of Advanced Principles of Agriculture.

Course Description:
This course is designed to extend and expand the basic skills developed through Fundamentals of Agriculture in agriculture production, leadership knowledge and advanced phases of agriculture education.

Standard 1.0

The student will analyze the career opportunities available in the agriculture industry and develop plans for entry into the area of personal interest.

Learning Expectations

The student will:

1.1 Evaluate career opportunities available and the requirements for pursuing a job in those areas.
1.2 Prepare categories of employment in non-agricultural careers that may have resulted from instruction or training in agriculture.
1.3 Determine the role of agencies that lend support to the agriculture industry.

Evidence Standard is met:

The student will:

- Determine agricultural career opportunities available in the local area.
- Chart the educational requirements needed for the career opportunities discussed.
- Describe the necessary skills needed for specific career opportunities.
- Specify the steps needed to enter a specific career field.
- Discuss salaries related to careers available in the local area.

Integration/Linkages

Economics, Ecology, Mathematics, Science, Language Arts, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Research careers available in the U. S related to the agricultural industry.
- Develop a chart to take students from high school into higher education and then into entry-level careers in agriculture (include time and educational requirements needed).
- Develop a portfolio that describes careers available to agricultural students with high school diplomas, technical experience, and university degrees.
- Interview a person involved in a career of interest and ask about preparing for that career.

Standard 2.0

The student will demonstrate skills needed for career planning, recordkeeping and leadership in the agriculture industry.

Learning Expectations:

The student will:

2.1 Plan, conduct and maintain records on an SAEP, supervised agricultural experience program.
2.2 Relate the knowledge and skills learned in the SAEP to an agriculture career.
2.3 Assess skills that may be developed by individuals in leadership roles.
2.4 Demonstrate public speaking skills.
2.5 Demonstrate methods and techniques of parliamentary procedure.
2.6 Conduct and facilitate group discussions and planning committees.

Evidence Standard is met:

The student will:

- Describe the importance of an SAEP in preparing for career success.
- Develop a business plan for a specific SAEP that interests the student.
- Explain the best methods to insure profitability.
- Compare different types of record keeping systems.
- Explain the steps of effective speech writing.
- Create a chart that describes whether motions are debatable, amendable and vote required.
- Prepare a program of activities that contains the essentials of a successful FFA chapter.

Integration/Linkages
Language Arts, Economics, Mathematics, Social Studies, National FFA Guidelines for SAEP, National FFA Guidelines for National Chapter Award, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks
- Prepare and present a speech on career opportunities in agriculture.
- Develop notes and perform extemporaneous speeches in class on current trends in agriculture.
- Preside as chairperson in mock meetings, utilizing ten parliamentary procedure abilities.
- Prepare agendas for FFA meetings.
- Complete a record book or use a computer to keep accurate records for the SAEP.
- Write sample articles for a local newspaper on the activities of the FFA chapter.

Standard 3.0
The student will relate the basic principles of animal science to livestock selection, health and maintenance.

Learning Expectations:
The student will:
3.1 Determine the function of the anatomical parts of an animal.
3.2 Evaluate the digestive processes of ruminant and nonruminant animals and the terminology associated with these processes.
3.3 Explain terminology, ration formulation, and feeding techniques necessary for maximizing livestock gains and cost efficiency.
3.4 Recognize symptoms of disease and parasites and determine what treatment and control method is to be used.
3.5 Relate terminology associated with livestock selection and evaluation.

Evidence Standard is met:
The student will:
- Diagram and describe the major anatomical structures of an animal.
- Distinguish the difference between the digestive process of a ruminant versus that of a non-ruminant.
- Formulate a ration for a specific breed of livestock based on its use.
- Identify and prescribe treatment for common diseases and parasites.
- Evaluate livestock using technical terms and procedures.

Integration/Linkages
Science, Biology, Mathematics, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Guidelines for the Livestock Judging CDE, National FFA Guidelines for the Dairy Judging CDE

Sample Performance Tasks
- Diagram the major parts of a beef animal.
- Categorize the parts and functions of a ruminant digestive system.
- Balance a ration.
- Compare diseases and parasites founded locally and the methods used to control them.
- Assess the placing of a class of livestock orally, using the guidelines of the National FFA CDE.

Standard 4.0
The student will relate the principles of soil formation, management and capability to crop production and construction uses.

Learning Expectations:
The student will:
4.1 Relate the basic principles of soils to plant science and crop production.
4.2 Determine the physical properties of soil necessary for selecting crops and determining conservation techniques.
4.3 Determine the factors that influence the rate of soil erosion.
4.4 Recommend soil management practices necessary for proper soil conservation.
4.5 Specify the land capability classes.
4.6 Prescribe the procedures for taking a soil sample.

Evidence Standard is met:
The student will:
- Predict the effect of quality soil on crop production.
- Analyze the general components of an average soil and discuss the effect these components have on productivity.
- Explain the effect slope and horizontal lengths have on potential soil erosion.
- Explain the six different management practices used to dispose of excess water.
- Classify land based on slope, drainage, erosion, and soil depth.
- Summarize the eight steps for securing a soil sample.

Integration/Linkages
Ecology, Mathematics, Chemistry, Botany, Language Arts, National 4-H Guidelines for the Soil Judging CDE, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks
- Explain the process of soil formations.
- Compare the three major soil particles.
- Calculate the slope of a given land site.
- Determine the appropriate land position for a terrace.
- Assess the requirements of a Class I soil.
- Determine the needs of a soil from a soil test.
- Participate in the FFA or 4-H soil judging CDE.

Standard 5.0
The student will demonstrate the basic principles of agriculture mechanics, including metalworking, plumbing, electricity, land leveling and land measuring.

Learning Expectations:
The student will:
5.1 Demonstrate safety precautions used in agricultural mechanics.
5.2 Demonstrate a working knowledge of metalwork necessary for the basic maintenance of an agricultural enterprise.
5.3 Discuss the use of plumbing tools and equipment necessary for agricultural maintenance.
5.4 Demonstrate various techniques used to measure and calculate a plot of land.
5.5 Demonstrate techniques of profile and differential leveling in determining land elevation.
5.6 Demonstrate a working knowledge of electricity.

Evidence Standard is met:
The student will:
- Outline general safety precautions involved in plumbing, metalwork, and electricity.
- Use metalworking equipment (arc and gas welders).
- Explain the procedures used in using plumbing equipment.
- Explain the steps used in calculating the number of square feet or acres in a plot of land.
- Explain the steps involved in profile and differential leveling.
- Diagram wire switches, junctions, and outlets according to local electrical codes.

Integration/Linkages
Physics, Mathematics, National FFA Guidelines for the Agricultural Mechanics CDE, SCANS (Secretary's Commission on Achieving Necessary Skills), TOSHA Guidelines, OSHA Guidelines

Sample Performance Tasks
- Select safety precautions appropriate to the job being performed.
- Prepare a weld using arc and oxyacetylene welders.
- Design a plumbing project to meet the needs of a home.
- Calculate the number of acres in a plot of land.
- Determine the difference in elevation between two points.
- Construct a wiring board using the rules of the National FFA electric wiring CDE.

Standard 6.0
The student will demonstrate the integration of academic competencies in Advanced Principles of Agriculture.

Mathematics:

The student will:

6.1 Calculate square footage to determine acreage in a plot of ground.
6.2 Properly use a measurement device to determine length and width.
6.3 Calculate cost per unit in a bill of materials.
6.4 Convert from the Metric measurements to English measurements.

Science:

The student will:

6.5 Assess chemical properties related to soil productivity.
6.6 Analyze soil fertility and composition.
6.7 Examine chemical properties used in fusing metal.
6.8 Analyze anatomy and physiology of animals.
6.9 Determine nutritional needs of animals, based on energy needs.
6.10 Compare the effects of diseases and pests on animal health.

Evidence Standard is met

The student will:

- Use algebraic equations to calculate land area.
- Determine crop needs based from soil analysis.
- Determine methods of maintaining animal health.

Integration / Linkages

Mathematics, Science, Economics, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Recommend crop varieties based on soil analysis.
- Recommend breeds of animals based on use and local environmental conditions.
- Determine acres of land found in a given plot.

Standard 7.0

The student will develop premier leadership and personal growth in the area of Advanced Principles of Agriculture.

Learning Expectations:

The student will:

7.1 Demonstrate a positive work ethic and attitude.
7.2 Develop problem-solving skills associated with an SAEP, supervised agriculture experience program.
7.3 Demonstrate the ability to conduct meetings in accordance with Robert's Rules of Order.
7.4 Prepare speeches to communicate the needs, concerns and challenges of the agricultural community.

Evidence Standard is met

The student will:

- Evaluate positive work ethics and attitudes seen in businesses and leaders.
- Demonstrate how proper planning can not only save on time, but also aid in solving problems.
- Develop a plan for an approved SAEP.
- Present oral reports on assigned topics on agricultural leadership and innovations.

Integration / Linkages

Mathematics, Language Arts, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Guidelines for the Parliamentary Procedure CDE, Robert's Rules of Order, National FFA Guidelines for Prepared Public Speaking CDE, National FFA Guidelines for Extemporaneous Speaking CDE

Sample Performance Task

- Prepare a six-to-eight-minute speech on an agricultural topic related to new challenges.
- Prepare a two-four-minute extemporaneous speech on a current agricultural topic.
- Conduct a mock business meeting using six parliamentary procedure abilities.
- Complete an FFA proficiency award application and FFA degree application, based on the SAEP.
- Prepare a personal resume, listing skills and attributes that make the applicant a desirable employee.